

# Decision Document

Solid Waste Management Unit B-10  
Building 101-3 East Catchment Pit  
Hawthorne Army Depot  
Hawthorne, Nevada



May 2000



Hawthorne Army  
Depot



# Decision Document SWMU B-10

May 2000

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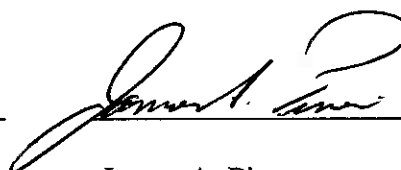
JUN 10 2000

ENVIRONMENTAL

The selected remedy is protective of human health and the environment. It has been shown that a complete pathway to human health and the environment does not exist, and there is no potential for an exposure pathway to be completed in the future.

**U. S. Army**

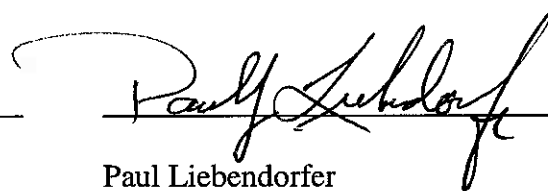
**26 JUN 2000**



James A. Piner  
Lt. Colonel, U.S. Army  
Commanding

**State of Nevada**

04 August 2000



Paul Liebendorfer  
Chief, Bureau of Federal Facilities

# Decision Document

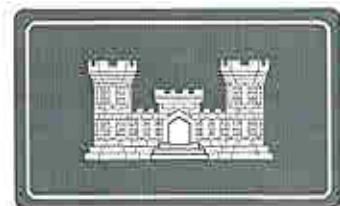
Solid Waste Management Unit B-10  
Building 101-3 East Catchment Pit  
Hawthorne Army Depot  
Hawthorne, Nevada



May 2000



Hawthorne Army  
Depot



**Decision Document**  
**SWMU B-10**  
**Building 101-3 Catchment Pit**  
**HAWTHORNE ARMY DEPOT**  
**HAWTHORNE, NEVADA**

## **1.0 Introduction:**

This decision document describes the rationale for the proposed closure of SWMU B-10, building 101-3 catchment pit, at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. This document was prepared by the U.S. Army Corps of Engineers, Sacramento District, with the help of HWAD for the Nevada Department of Environmental Protection (NDEP).

Ecology and Environmental Inc. (E&E), was tasked by the US Army Corps of Engineers, Sacramento District (USACE), to perform remedial investigations at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. These tasks were conducted from 1993 through 1997, primarily at solid waste management units (SWMUs) designated by the Army and the Nevada Division of Environmental Protection (NDEP). The NDEP is the lead regulatory agency for environmental issues at HWAD. The purpose of the sampling was to determine the extent and degree of environmental impacts, if any, associated with activities performed at each SWMU. The primary goal of the investigation was to assess the environmental impacts and to report the findings, present conclusions, and recommend any remediation, if necessary.

With guidance from the NDEP, basewide proposed closure goals (PCGs) for soil were established as acceptable levels so that SWMU closure could be recommended and to assist in directing the investigative efforts toward those SWMUs where the target analytes were of greatest concern (Appendix A). These PCGs were used as action levels throughout this investigation and are used for comparison with the detected analytes in this report.

## **2.0 Site History**

SWMU B10 is in the HWAD's central magazine area, on the south side of the 101 Production Area (Figure 1-1). SWMU B10 consists of two inactive unlined catchment pits located north of Building 101-3 (Figure 1-2). Each pit measured approximately 15 feet wide by 15 feet long and is two to four feet deep. The southeastern-most pit contained approximately two feet of windblown sand, and the northeastern-most pit contained approximately one foot of windblown sand (Figure 1-2).

The USACE, HWAD, and the NDEP agreed to define the boundaries of each SWMU using annotated monuments and survey pins. As part of E&E's 1997 field investigations,

a survey monument was constructed and surveyed at SWMU B10. A brass survey pin on the monument designates the monument number HWAAP-78-1996 and the SWMU number B10. Three corner pins were set and surveyed to define the SWMU boundary, with the monument as the northwest corner. The location of these corner markers and the SWMU boundaries are shown on Figure 1-2. Survey data is presented in Appendix B.

### 3.0 Site Conditions

The catchment pit at SWMU B10 reportedly was in operation from 1940 to the early 1970s and received large amounts of reactive hazardous wastewater containing TNT and cyclotrimethylenetrinitramine (RDX). Based on the past uses of the pit and observations during the previous site inspections, the target analytes are explosives and metals.

USAEHA estimated the depth to ground water in the vicinity of SWMU B10 at approximately 120 feet below ground surface (bgs) in 1987 and 1988 (USAEHA 1988).

### 4.0 INVESTIGATIONS

Site inspections of SWMU B10 were conducted by the USAEHA (1988), Jacobs Engineering (1988), and RAI (1992). During these inspections, evidence of TNT contamination (red stained soil) was noted in the catchment pit. No investigation activities were conducted during these inspections, and no soil samples were collected.

In 1994, sampling activities proposed by E&E for the remedial investigation at SWMU B10 included collecting and analyzing surface and subsurface soil samples. Soils encountered during E&E's 1994 investigation of SWMU B10 were primarily fine to medium sands with minor gravels. A reddish-brown coloration was noted near the surface of hand auger location CPS02. However the coloration appeared to be natural, and no obvious evidence of bulk or concentrated explosives contamination was observed (E&E 1995). All soil samples collected during this remedial investigation were analyzed for metals, explosives, picric acid, nitrate, and pH.

One surface soil sample and one near-surface soil sample were collected from one hand auger location in each of the two catchment pits, for a total of four samples (Figure 3-1). The subsurface investigation at SWMU B10 consisted of two CPT soundings with adjacent sample borings drilled on the downgradient sides of each of the catchment pits. Both a CPT sounding boring and a CPT sample boring were drilled at each location, CPS01 and CPS02, shown on Figure 3-1. The soundings at CPS01 and CPS02 were advanced to a total depth of 34 feet and 54 feet, respectively.

Up until 1998 all investigations and investigation results were based on the premise that red stained soil indicted the presence of TNT contamination. In late 1998 doubts came up about the red stained soil actually being an indicator of TNT in the soil. In January 1999 USACE sampled the stained soil in the pit area of B-10.

## 5.0 Investigation Results

Arsenic (1.7 mg/kg to 5.6 mg/kg), barium (38 mg/kg to 130 mg/kg), total chromium (1.4 mg/kg to 4.8 mg/kg), and lead (8.7 mg/kg to 14 mg/kg) were detected in all four of the surface and near-surface hand auger samples collected from within both catchment pits. Cadmium was detected only in the surface soil sample collected from the northwestern catchment pit at a concentration of 0.53 mg/kg. Beryllium, mercury, and selenium were not detected in any of the surface and near-surface samples.

Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) was detected at concentrations ranging from 0.55 mg/kg to 2.8 mg/kg in the surface soil samples of both catchment pits. RDX was detected at 4.4 mg/kg and TNT was detected at 0.43 mg/kg in the surface soil sample at location HA01 in the northwest catchment pit. No other explosives were detected in the surface and near-surface samples.

Arsenic (3.7 mg/kg to 16 mg/kg), barium (25 mg/kg to 190 mg/kg), total chromium (6.1 mg/kg to 320 mg/kg), and lead (1.8 mg/kg to 22 mg/kg) were detected in all six of the subsurface samples. Beryllium was detected at CPT location CPS01 at depths of 8 feet and 18 feet bgs at concentrations 0.55 mg/kg and 0.69 mg/kg, respectively.

Four explosive compounds and picric acid were detected only in the 9-foot deep sample collected from CPS02. RDX was detected at 55 mg/kg, HMX was detected at 4.4 mg/kg, 2-amino-4,6-DNT was detected at 1.2 mg/kg, sym-trinitrobenzene (TNB) was detected at 4.9 mg/kg, and picric acid was detected at 3.5 mg/kg. No other explosive compounds were detected in the subsurface samples. The results of the E&E sampling are shown in appendix C.

All of the target metal analytes in all of the soil samples at this SWMU were reported at concentrations that did not exceed their respective PCGs or their respective maximum expected background levels. There does not appear to have been a release of metals that has impacted the soil at SWMU B10.

No impact to the ground water from metals at SWMU B10 is evident beyond the naturally occurring background concentrations observed basewide.

Although explosives have been detected in the soils at SWMU B10, no impact to the ground water from this SWMU is evident.

The 1999 sampling of the red stained soil at SWMU B-10 indicated an analysis result of RDX at 129 ppm; at a location 5 feet below ground surface. TNT levels from this red stained soil were analyzed to be <1.3 ppm. The RDX concentration would put the contamination level above PCG's but below PEG's. The results of this sample are shown in appendix D.

The Remedial Investigation Report concluded that a "significant release of explosives had impacted the soils at SWMU B-10". As all laboratory testing indicated no contamination above

action limits, this conclusion was reached because of the stained soil present at the SWMU. At that time, red stained soils were known to indicate TNT contamination. As these areas were known locations of TNT contamination, the red stained areas were not sampled. A RI report would then always indicate the need for remediation, if red stained soils were present at a SWMU. Subsequent sampling of the stained soil at SWMU B-10 did not indicate any TNT contamination. Therefore, even with a RI that indicates the site was contaminated and required remediation, subsequent testing negates that conclusion. Had the testing information of January 1999 been available in December 1997 the conclusion of the RI would have been, and should have been, no further action.

## **6.0 Remediation**

No remediation required at this site

## **7.0 Remediation Results**

N.A.

## **8.0 Public Involvement:**

It is the U.S. Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established and maintains a repository library at the local public library. This repository includes final copies of all past studies and other documents regarding environmental issues at HWAD. As future environmental documents are made available to HWAD the repository shall be updated.

HWAD has solicited community participation in establishment of a restoration and advisory board (RAB). To date there has been insufficient response and HWAD has not formed a RAB. HWAD has held open houses to inform the public of on going environmental issues. HWAD shall continue to solicit community involvement, and will establish a RAB should sufficient community interest be obtained.

## **9.0 Conclusions**

SWMU B-10 did not have any contamination above action limits. The SWMU was backfilled with clean soil. SWMU B-10 should be closed with the restriction that the area be only for industrial use and documented on the depot site master plan.

## 10.0 REFERENCES

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- Ecology and Environment. 1995. RCRA Facility Assessment Report for 24 Solid Waste Management Units, Hawthorne Army Depot, Hawthorne, Nevada. April 1995.
- Jacobs Engineering, 1988. RCRA Facility Assessment, Hawthorne Army Ammunition Plant, TES IV Work Assignment No. 433.
- Millsap, Herman. 1977. Hawthorne Army Depot. Personal communication via telephone with Richard Brunner of Tetra Tech, July 17, 1997.
- RAI. 1992. Site Screening Inspection (SSI) for the Hawthorne Army Ammunition Plant, Hawthorne, Nevada. Prepared for the US Army Corps of Engineers Toxic and Hazardous Materials Agency by Resource Applications, Inc., Falls Church, Virginia. December 1992.
- Tetra Tech. 1997a. Draft Quarterly Ground Water Monitoring Report, First Quarter 1997, Hawthorne Army Depot, Hawthorne, Nevada. April 1997.
- \_\_\_\_\_. 1997b. Quarterly Ground Water Monitoring Report, Second Quarter 1997, Hawthorne Army Depot, Hawthorne, Nevada. July 1997.
- \_\_\_\_\_. 1997c. Final Data Package with recommendations for future action, Group B solid waste management units, Hawthorne Army Depot, Hawthorne, Nevada, Volumes 1, 2a, and 2b. January 1997.
- \_\_\_\_\_. 1997d. Final Technical Memorandum Background Sampling at the Hawthorne Army Depot, Hawthorne, Nevada. March 1997.
- \_\_\_\_\_. 1997. Final Remedial Investigation Report, Hawthorne Army Depot, Hawthorne, Nevada. December 1997.
- USACE. 1995. Risk Assessment Handbook: Volume I Human Health Assessment (EM 200-1-4). USACE. June 1995.
- \_\_\_\_\_. 1999. Final Field Sampling Report, West 101 Production Area: Hawthorne Army Depot, Hawthorne, Nevada. April 1999.
- USAEHA. 1988. Final Report. Ground Water Contamination Survey No. 38-26-0850-88. Evaluation of Solid Waste Management Units. HWAAP, Hawthorne, Nevada. May 12-19, 1987 and August 1-5, 1988.

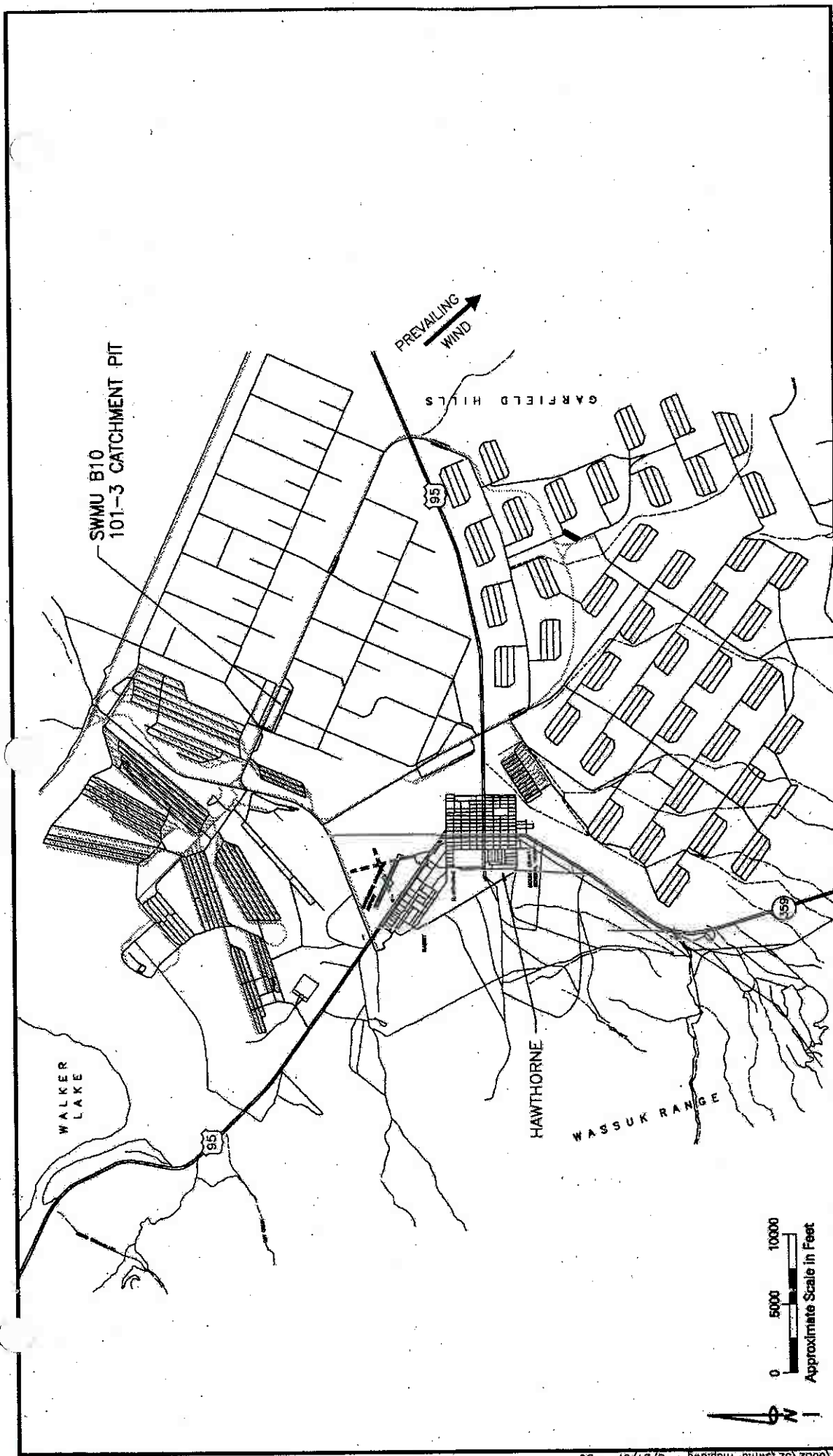


USATHAMA. 1977. Installation Assessment of Naval Ammunition Depot, Hawthorne, Nevada. U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland. Records Evaluation Report No. 114.

USEPA. 1989. Risk Assessment Guidance for Superfund. Volume I Human Health Evaluation Manual (Part A). December 1989.

\_\_\_\_\_. 1996. Region IX Preliminary Remediation Goals. USEPA Region IX. August 1996.

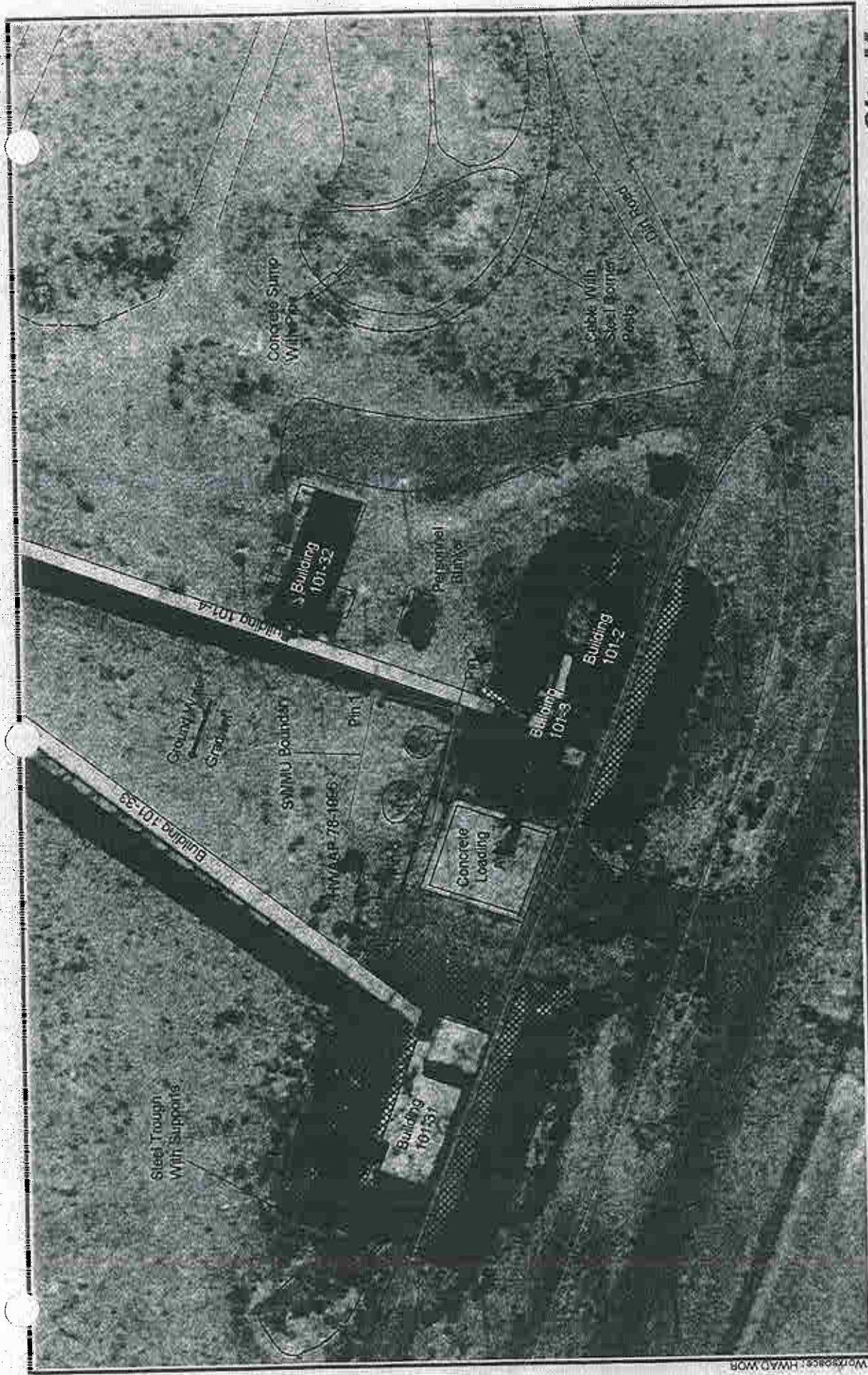
WaterWork. 1990. Hawthorne Army Ammunition Plant, Area 101 Surface Impoundments, Field and Lab Data and Analysis, Attachment 1-8.



SOURCE: TETRA TECH FINAL DATA PACKAGE, 1996 (REV. 1997)

**Figure 1-1**

Hawthorne Army Depot  
Hawthorne, Nevada

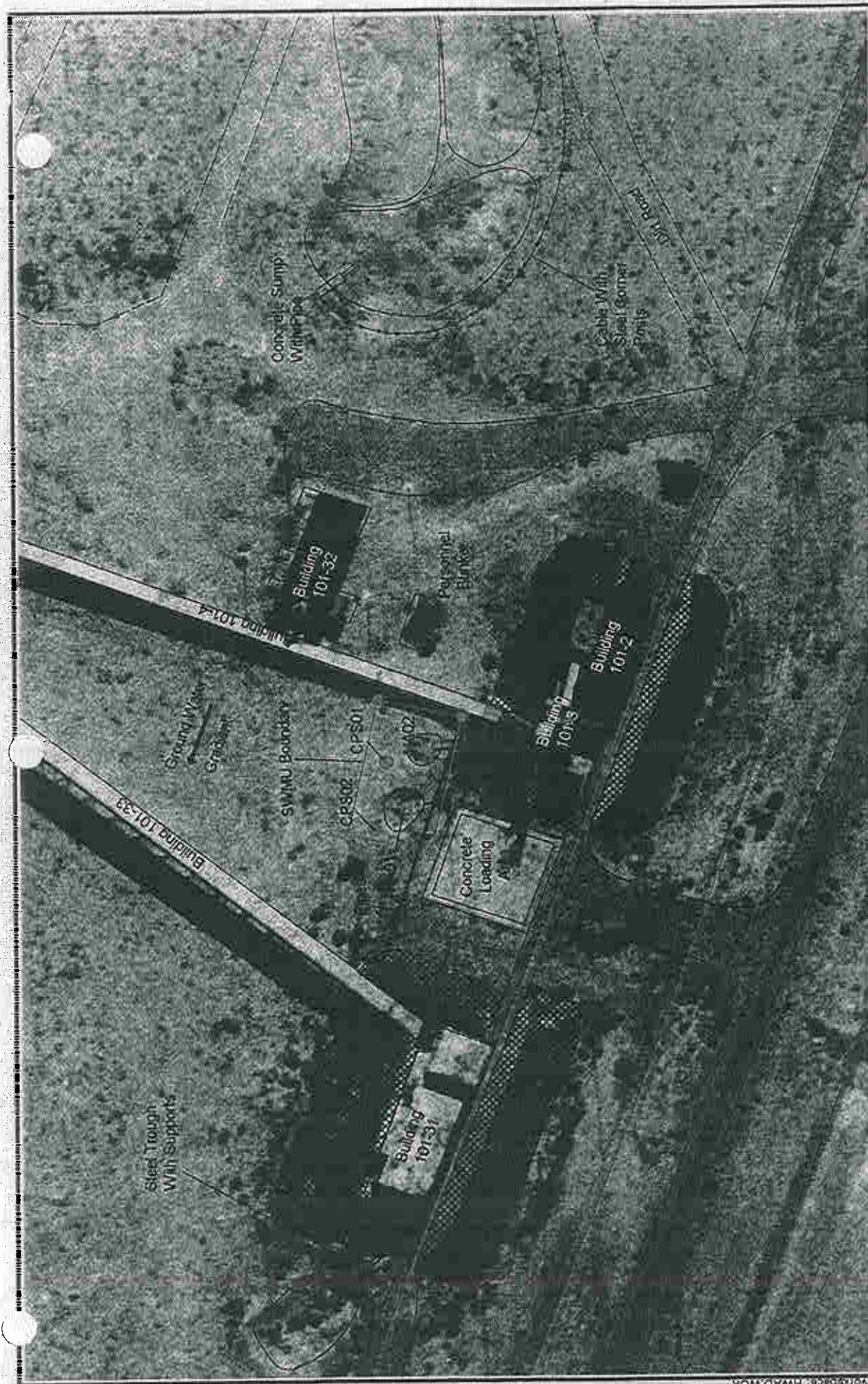


**Site Map**  
**SWMU B10**  
**101-3 Catchment Pit**  
 Hawthorne Army Depot  
 Hawthorne, Nevada  
**Figure 1-2**

**Legend:**

- Boundary Corner Pin
- Explosion Barrier
- Fence
- Railroad
- SWMU Monument





Workpackage: HWAD.W08

# Legend:

## Investigation Activity Map SWMU B10 101-3 Catchment Pit

Hawthorne Army Depot  
Hawthorne, Nevada

Figure 3-1

## **Appendix A**

**Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada**

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-Carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Nitrate	Anion	NC	128,000	Calculated Subpart S <sup>a</sup>
2-Amino-dinitrotoluene	Explosive	NC	-	NA <sup>a</sup>
4-Amino-dinitrotoluene	Explosive	NC	-	NA
1,3-Dinitrobenzene	Explosive	NC	8	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	150	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
HMX	Explosive	NC	4,000	Calculated Subpart S
Nitrobenzene	Explosive	NC	40	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	800	Calculated Subpart S
RDX	Explosive	NC	64	Calculated Subpart S
Tetryl	Explosive	NC	800	Calculated Subpart S
1,3,5-Trinitrobenzene	Explosive	NC	4	Calculated Subpart S
2,4,6-Trinitrotoluene	Explosive	C	233	Calculated Subpart S
Aluminum	Metal	NC	80,000	Calculated Subpart S
Arsenic (cancer endpoint)	Metal	C & NC	30	Background <sup>a</sup>
Barium and compounds	Metal	NC	5,600	Calculated Subpart S
Beryllium and compounds	Metal	C	1	Background
Cadmium and compounds	Metal	NC	40	Calculated Subpart S
Chromium III and compounds	Metal	NC	80,000	Calculated Subpart S
Lead	Metal	NC	1000	PRG <sup>d</sup>
Mercury and compounds (Inorganic)	Metal	NC	24	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	400	Calculated Subpart S
Acenaphthene	PAH	NC	4,800	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.96	Calculated Subpart S
Benzo[a]pyrene	PAH	C	0.10	Detection Limit <sup>a</sup>
Benzo[b]fluoranthene	PAH	C	0.96	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	10	Calculated Subpart S
Chrysene	PAH	C	96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	C	0.96	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	NC	3,200	Calculated Subpart S
Indeno[1,2,3-cd]pyrene	PAH	C	-	NA
Naphthalene	PAH	NC	3,200	Calculated Subpart S
Pyrene	PAH	NC	2,400	Calculated Subpart S
Total Petroleum Hydrocarbons as Diesel (TPH-d)	PAH	C	100	NDEP Level Clean-up <sup>f</sup>
Polychlorinated biphenyls (PCBs)	PCBs	C	25	TSCA <sup>a</sup>
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	1,600	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C	89	Calculated Subpart S

**Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada**

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HAWAD Proposed Closure Goals for Soil (mg/kg)	HAWAD Proposed Closure Goal Source
Butyl benzyl phthalate	SVOC	NC	16,000	Calculated Subpart S
Dibromochloromethane	SVOC	C	83	Calculated Subpart S
Dibutyl-phthalate	SVOC	NC	8,000	Calculated Subpart S
Diethyl phthalate	SVOC	NC	64,000	Calculated Subpart S
Phenanthrene	SVOC		-	NA
Phenol	SVOC	NC	48,000	Calculated Subpart S
Acetone	VOC	NC	800	Calculated Subpart S
Anthracene	VOC	NC	24,000	Calculated Subpart S
Benzene	VOC	C	24	Calculated Subpart S
Bis(2-chloroisopropyl) ether	VOC	C	3,200	Calculated Subpart S
Bromomethane	VOC	NC	112	Calculated Subpart S
Carbon tetrachloride	VOC	C	5	Calculated Subpart S
Chlorobenzene	VOC	NC	1,600	Calculated Subpart S
Chloroform	VOC	C	115	Calculated Subpart S
Chloromethane	VOC	C	538	Calculated Subpart S
Dibromomethane	VOC	C	0.008	Calculated Subpart S
1,2-Dichlorobenzene	VOC	NC	7,200	Calculated Subpart S
1,4-Dichlorobenzene	VOC	C	18,300	Calculated Subpart S
Dichlorodifluoromethane	VOC	C	16,000	Calculated Subpart S
Ethylbenzene	VOC	NC	8,000	Calculated Subpart S
Methylene bromide	VOC	NC	800	Calculated Subpart S
Methylene chloride	VOC	C	4,800	Calculated Subpart S
2-Methylnaphthalene	VOC		-	NA
1,1,2,2-Tetrachloroethane	VOC	C	35	Calculated Subpart S
Tetrachloroethylene (PCE)	VOC	C & NC	800	Calculated Subpart S
Toluene	VOC	NC	16,000	Calculated Subpart S
1,1,1-Trichloroethane	VOC	NC	7,200	Calculated Subpart S
Trichloroethylene (TCE)	VOC	C & NC	480	Calculated Subpart S
Trichlorofluoromethane	VOC	NC	24,000	Calculated Subpart S
1,2,3-Trichloropropane	VOC	C	480	Calculated Subpart S
Vinyl chloride	VOC	C	0.37	Calculated Subpart S
Xylene Total (m-, o-, p-)	VOC	NC	160,000	Calculated Subpart S
2,3,7,8-TCDD	Dioxin	C	0.000005	Calculated Subpart S

\* RCRA 55 FR 30870

<sup>b</sup> Not available

<sup>c</sup> Highest background concentration detected in 50 background soil samples

<sup>d</sup> Smucker, Stanford J. USEPA Region IX, Preliminary Remedial Goals, Second Half, Sep. 1995

<sup>e</sup> Method detection limit for Volatile Organic Compounds by EPA Method 8260 or Semi-Volatile Organic Compounds analyzed by EPA Method 8270

<sup>f</sup> Nevada Division of Environmental Protection

<sup>g</sup> Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 761

SAP (9/98, Final) - West 101 Production Area (HWAD)

Proposed Excavation Goal (PEG's) by Definitive and Screening \* Analysis-  
Maximum Concentration of Contaminants  
In Soil to Be Left in Place at Depth Below the Surface

Contaminant	Concentration (mg/kg)
2,4,6,-trinitrotoluene (TNT)	800*
2,4-dinitrotoluene (2,4-DNT)	80
2,6-dinitrotoluene (2,6-DNT)	80
1,3,5-trinitrobenzene (1,3,5-TNB)	150
1,3,-drinitrobenzne (1,3-DNB)	NE
2-amino-4,6dinitrotoluene (2-Am-DNT)	NE
4-amino-2,6-dinitrotoluene (4-Am-DNT)	NE
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	4000
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	300
Picric acid	7.0
Pentachlorophenol	NE
Nitroaromatics/Nitroamines	<30



SAP (9/98, Final) - West 101 Production Area (HWAD)

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Clean-up Goals by Screening\* and Definitive Analysis

Contaminant	Concentration (mg/kg)
2,4,6,-trinitrotoluene (TNT)	40*
2,4-dinitrotoluene (2,4-DNT)	2.6
2,6-dinitrotoluene (2,6-DNT)	2.6
1,3,5-trinitrobenzene (1,3,5-TNB)	4
1,3,-drinitrobenzne (1,3-DNB)	8
2-amino-4,6dinitrotoluene (2-Am-DNT)	NE
4-amino-2,6-dinitrotoluene (4-Am-DNT)	NE
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	100
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	64
Picric acid	7
Pentachlorophenol	None

NE - not established

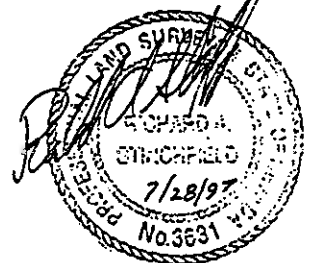
**Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada**

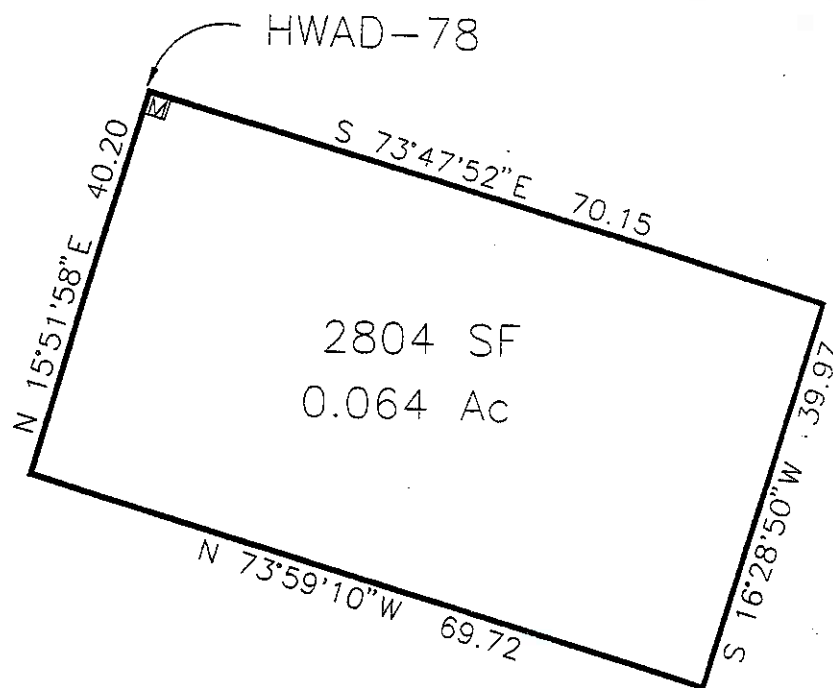
Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-Carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
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4-Amino-dinitrotoluene	Explosive	NC	-	NA
1,3-Dinitrobenzene	Explosive	NC	8	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	160	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
HMX	Explosive	NC	4,000	Calculated Subpart S
Nitrobenzene	Explosive	NC	40	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	800	Calculated Subpart S
RDX	Explosive	NC	64	Calculated Subpart S
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Arsenic (cancer endpoint)	Metal	C & NC	30	Background <sup>a</sup>
Barium and compounds	Metal	NC	5,600	Calculated Subpart S
Beryllium and compounds	Metal	C	1	Background
Cadmium and compounds	Metal	NC	40	Calculated Subpart S
Chromium III and compounds	Metal	NC	80,000	Calculated Subpart S
Lead	Metal	NC	1000	PRG <sup>d</sup>
Mercury and compounds (inorganic)	Metal	NC	24	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	400	Calculated Subpart S
Acenaphthene	PAH	NC	4,800	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.96	Calculated Subpart S
Benzo[a]pyrene	PAH	C	0.10	Detection Limit <sup>a</sup>
Benzo[b]fluoranthene	PAH	C	0.96	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	10	Calculated Subpart S
Chrysene	PAH	C	96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	C	0.96	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	NC	3,200	Calculated Subpart S
Indeno[1,2,3-cd]pyrene	PAH	C	-	NA
Naphthalene	PAH	NC	3,200	Calculated Subpart S
Pyrene	PAH	NC	2,400	Calculated Subpart S
Total Petroleum Hydrocarbons as Diesel (TPH-d)	PAH	C	100	NDEP Level Clean-up <sup>f</sup>
Polychlorinated biphenyls (PCBs)	PCBs	C	25	TSCA <sup>g</sup>
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	1,600	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C	89	Calculated Subpart S

## **Appendix B**

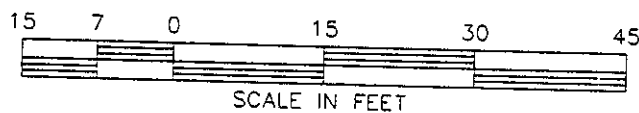
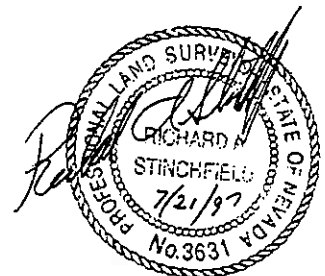
## NOTES

1. FOR THE LOCATION OF THE FOLLOWING SWMU'S, REFER TO FIGURE 3-6 OF THE "FINAL R.C.R.A. FACILITY INVESTIGATION REPORT OF GROUP "A" SOLID WASTE MANAGEMENT UNITS A-04, B-16, B-21, B-24, B-26, AND H-01".
2. THE "HWAD" MONUMENTS AS SHOWN HEREIN AS "M", ARE A 1' X 1' X 2'+ CONCRETE MONUMENT WITH A BRASS CAP STAMPED AS PER SPECIFICATIONS. ALL OF THE OTHER CORNERS ARE MARKED BY A 5/8" RE-BAR WITH A PLASTIC CAP STAMPED "STINCHFIELD PLS 3631" UNLESS NOTED OTHERWISE ON THE MAPS.
3. HORIZONTAL DATUM IS BASED ON NAD 83(1994) AND MORE SPECIFICALLY, NGS STATION "W 2". "W 2" IS A FEDERAL BASE NETWORK CONTROL STATION AND IS LOCATED IN THE APPROXIMATE CENTER OF THIS PROJECT.
4. VERTICAL DATUM IS BASED ON NAVD 29. NAVD 88 ELEVATIONS HAVE BEEN SCALED AND THEREFORE ARE NOT ACCURATE. VERTICAL CONTROL USING GPS WAS USED TO ESTABLISH THE ELEVATIONS OF THE EXISTING CONTROL POINTS AND THE "HWAD" MONUMENTS. THE VALUE OF NGS STATION "W 2" WAS USED AS A BASIS FOR THE VERTICAL CONTROL.
5. COORDINATE VALUES OF EXISTING NGS CONTROL, TRAVERSE POINTS, AND HWAD MONUMENTS ARE STATE PLANE COORDINATES, WEST ZONE.
6. THE COMBINED FACTOR WAS CALCULATED USING THE FOLLOWING FIGURES. THE "MAP SCALE" AT POINT "W 2" IS 0.99990022, THE MEAN ELEVATION OF THE TOTAL PROJECT WAS TAKEN AS 4150.00 FEET ABOVE SEA LEVEL AND THE MEAN RADIUS OF THE EARTH WAS TAKEN AS 20,906,000 FEET. THE SEA LEVEL FACTOR WAS CALCULATED AS FOLLOWS:  $20,906,000 / 20,906,000 + 4150.00 = 0.999801532$ . THE COMBINED FACTOR (CF) WAS CALCULATED AS FOLLOWS:  $0.99990022 \times 0.999801532 = 0.999701772$ .
7. GROUND DISTANCE X CF (0.999801532) = GRID DISTANCE.
8. GRID DISTANCE X INVERSE CF (1.00298317) = GROUND DISTANCE.
9. COORDINATE VALUES OF ALL OTHER POINTS INCLUDING SWMU CORNERS OTHER THAN "HWAD" MONUMENTS, REFERENCE POINTS, TEST PIT OR HOLE LOCATIONS ETC., WERE CALCULATED USING GROUND DISTANCES AND ARE THEREFORE NOT TRUE STATE PLANE COORDINATES.
10. DISTANCES AS SHOWN ON THESE SWMU'S ARE HORIZONTAL GROUND DISTANCES.





NW COR	N	14512198.389	E	2622563.482	ELEV 4195.880
NE COR	N	14512178.814	E	2622630.850	ELEV 4197.019
SE COR	N	14512140.483	E	2622619.510	ELEV 4197.615
SW COR	N	14512159.718	E	2622552.491	ELEV 4197.722



SWMU B10 Survey Data  
Hawthorne Army Depot  
Hawthorne, Nevada

SWMU	Point ID	Northing (feet)	Easting (feet)	Elevation
B10	HA02	1388823.89	498204.14	NE
B10	HA01	1388833.89	498175.74	NE
B10	CPS02	1388848.89	498164.64	NE
B10	CPS01	1388840.89	498198.34	NE
B10	Pin 3	1388816.8	498159.24	4197.722
B10	Pin 2	1388812.36	498220.36	4197.615
B10	Pin 1	1388858.08	498223.26	4197.019
B10	HWAAP-78-1996	1388862.45	498162.3	4195.880

Notes:

NE = Not established

Coordinate data based on electronic map file using the NAD 1927 datum.

Elevation data based on surveyors map using NGVD 1929 datum.

## **Appendix C**

Nitrogen  
Method 353.2 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Nitrogen Nitrate mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	6.9
B10-HA1-2-005	HA02	5/2/94	5	ASC	1.2
B10-HA1-1-005	HA01	5/3/94	5	ASC	1.5
B10-HA1-2-000	HA02	5/3/94	0	ASC	4.9
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	11
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	8.1
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	<1.1
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	5.7
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	1.4
Analyses					9
Detections					8
Minimum Concentration					1.2
Maximum Concentration					11
HWAD - PCG					128000
HWAD - PCG Hits					0



**Metals**  
**Method 6101A (ASC)**

Sample ID	Location ID	Sample Date	Depth	Lab	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium Total mg/kg	Lead mg/kg	Selenium mg/kg	Silver mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	NA	38	<0.52	0.53	1.4	NA	NA	<1
B10-HA1-2-005	HA02	5/2/94	5	ASC	4.6	62	<0.51	<0.51	3.6	8.7	<0.51	<1
B10-HA1-1-005	HA01	5/3/94	5	ASC	5.6	130	<0.54	<0.54	4.8	11	<0.54	<1.1
B10-HA1-2-000	HA02	5/3/94	0	ASC	3.4	56	<0.5	<0.5	3	14	<0.5	<1
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	16	190	0.55	<0.54	9.2	4.9	<0.54	<1.1
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	10	190	<0.55	<0.55	7.8	4.9	<0.55	<1.1
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	4.8	97	0.69	<0.53	10	7.5	<0.53	<1.1
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	3.7	57	<0.53	<0.53	6.1	22	<0.53	<1.1
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	4.7	71	<0.58	<0.58	320	4.6	<0.58	<1.2
Analyses					8	9	9	9	9	8	8	9
Detections					8	9	2	1	9	8	0	0
Minimum Concentration					3.4	38	0.55	0.53	1.4	4.6	0	0
Maximum Concentration					16	190	0.69	0.53	320	22	0	0
HWAD - PCG					100	2000	1	20	20	100	20	100
HWAD - PCG Hits					0	0	0	0	1	0	0	0

**Notes:**

NA = Not analyzed

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Arsenic  
Method 7060 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Arsenic mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	1.7
B10-HA1-2-005	HA02	5/2/94	5	ASC	4.6
B10-HA1-1-005	HA01	5/3/94	5	ASC	5.6
B10-HA1-2-000	HA02	5/3/94	0	ASC	3.4
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	16
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	10
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	4.8
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	3.7
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	4.7
Analyses					9
Detections					9
Minimum Concentration					1.7
Maximum Concentration					16
HWAD - PCG					100
HWAD - PCG Hits					0

Lead  
Method 7421 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Lead
					mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	13
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	4.9
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	4.9
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	7.5
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	4.6
Analyses					5
Detections					5
Minimum Concentration					4.6
Maximum Concentration					13
HWAD - PCG					100
HWAD - PCG Hits					0

Mercury  
Method 7471 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Mercury mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	<0.1
B10-HA1-2-005	HA02	5/2/94	5	ASC	<0.1
B10-HA1-1-005	HA01	5/3/94	5	ASC	<0.11
B10-HA1-2-000	HA02	5/3/94	0	ASC	<0.1
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	<0.11
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	<0.11
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	<0.11
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	<0.11
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	<0.12
Analyses					9
Detections					0
Minimum Concentration					0
Maximum Concentration					0
HWAD - PCG					24
HWAD - PCG Hits					0

Notes:

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Selenium  
Method 7740 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Selenium mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	<0.52
B10-HA1-2-005	HA02	5/2/94	5	ASC	<0.51
B10-HA1-1-005	HA01	5/3/94	5	ASC	<0.54
B10-HA1-2-000	HA02	5/3/94	0	ASC	<0.5
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	<0.54
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	<0.55
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	<0.53
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	<0.53
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	<0.58
Analyses					9
Detections					0
Minimum Concentration					0
Maximum Concentration					0
HWAD - PCG					20
HWAD - PCG Hits					0

Notes:

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

**Explosives**  
**Method 8330 (ASC)**

Sample ID	Location ID	Sample Date	Depth	Lab	2,4,6-TNT mg/kg	2,4-Dinitrotoluene mg/kg	2,6-Dinitrotoluene mg/kg	2-Amino-4,6-DNT mg/kg	2-Nitrotoluene mg/kg	3-Nitrotoluene mg/kg	4-Amino-2,6-DNT mg/kg	4-Nitrotoluene mg/kg	HMX mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	0.43 J	<1	<1	<1	<1	<1	<1	<1	2.8
B10-HA1-2-005	HA02	5/2/94	5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
B10-HA1-1-005	HA01	5/3/94	5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
B10-HA1-2-000	HA02	5/3/94	0	ASC	<1	<1	<1	<1	<1	<1	<1	<1	0.55 J
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	<1	<1	<1	<1	<1	<1	<1	<1	4.4
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	<1	<1	<1	1.2	<1	<1	<1	<1	<1
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
Analyses					9	9	9	9	9	9	9	9	9
Detections					1	0	0	1	0	0	0	0	3
Minimum Concentration					0.43	0	0	1.2	0	0	0	0	0.55
Maximum Concentration					0.43	0	0	1.2	0	0	0	0	4.4
HWAD - PCG					233	2.6	80		800	800		800	4000
HWAD - PCG Hits					0	0	0		0	0		0	0

Notes:  
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives  
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	m-Dinitrobenzene mg/kg	Nitrobenzene mg/kg	RDX mg/kg	sym-Trinitrobenzene mg/kg	Tetryl mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	<1	<1	4.4	<1	<1
B10-HA1-2-005	HA02	5/2/94	5	ASC	<1	<1	<1	<1	<1
B10-HA1-1-005	HA01	5/3/94	5	ASC	<1	<1	<1	<1	<1
B10-HA1-2-000	HA02	5/3/94	0	ASC	<1	<1	<1	<1	<1
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	<1	<1	<1	<1	<1
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	<1	<1	<1	<1	<1
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	<1	<1	<1	<1	<1
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	<1	<1	55	4.9	<1
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	<1	<1	<1	<1	<1
Analyses					9	9	9	9	9
Detections					0	0	2	1	0
Minimum Concentration					0	0	4.4	4.9	0
Maximum Concentration					0	0	55	4.9	0
HWAD - PCG					8	40	64	4	800
HWAD - PCG Hits					0	0	0	1	0

Notes:  
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Picric Acid  
Method 8330M (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Picric Acid mg/kg
B10-HA1-1-000	HA01	5/2/94	0	ASC	<0.25
B10-HA1-2-005	HA02	5/2/94	5	ASC	<0.25
B10-HA1-1-005	HA01	5/3/94	5	ASC	<0.25
B10-HA1-2-000	HA02	5/3/94	0	ASC	<0.25
B10-CPS1-1-008	CPS01	5/22/94	8	ASC	<0.25
B10-CPS1-1-010	CPS01	5/22/94	10	ASC	<0.25
B10-CPS1-1-018	CPS01	5/22/94	18	ASC	<0.25
B10-CPS1-2-009	CPS02	5/22/94	9	ASC	3.5
B10-CPS1-2-018	CPS02	5/22/94	18	ASC	<0.25

Analyses	9
Detections	1
Minimum Concentration	3.5
Maximum Concentration	3.5

HWAD - PCG	7
HWAD - PCG Hits	0

Notes:

NE = Not established





## **Appendix D**

**HWAAP-SWMU-B-10**

COMPONENT	Unit	PQL	SS10-99-01
Moisture	%	0.5	2.1
<b>Nitroaromatics and nitroamines</b>			
Dilution Factor			5
4-Amino-2,6-dinitrotoluene	mg/kg	0.17	<0.87
2-Amino-4,6-dinitrotoluene	mg/kg	0.24	<1.2
1,3-Dinitrobenzene	mg/kg	0.25	<1.3
2,4-Dinitrotoluene	mg/kg	0.09	<0.46
2,6-Dinitrotoluene	mg/kg	0.05	<0.26
HMX	mg/kg	0.25	14
Nitrobenzene	mg/kg	0.24	2.3
3-Nitrotoluene	mg/kg	0.25	<1.3
RDX	mg/kg	0.25	129
Tetryl	mg/kg	0.19	<0.97
1,3,5-Trinitrobenzene	mg/kg	0.24	39
2,4,6-Trinitrotoluene	mg/kg	0.25	<1.3
2/4-Nitrotoluene	mg/kg	0.25	<1.3

## **Appendix E**



B10, View into pit.



B10, View into pit.



**SWMU B-10, September 1999**